Remarks

The Office Action mailed April 4, 2006 has been carefully reviewed and the following remarks have been made in consequence thereof.

Claims 8-21 are pending in this application. Claims 8-10, 15-18 and 21 stand rejected. Claims 11-14, 19 and 20 have been withdrawn.

Entry of the amendments is proper under 37 CFR §1.116 since the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issue requiring further search and/or consideration as the amendments amplify issues previously discussed throughout prosecution; (c) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (d) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

The rejection of Claims 8-10 and 15-18 under 35 U.S.C. § 102(b) as being anticipated by Dyste et al. (U.S. Patent 3,222,864) ("Dyste") is respectfully traversed.

Dyste describes a gas turbine engine-recuperator combination (10) including a gas turbine engine (12) and a recuperator (14) having an annular heat exchanger (56). The gas turbine engine (12) includes an annular outer casing (16), an annular wall (38) **concentrically disposed within** the turbine engine casing (16), and a power unit (22). The power unit (22) includes a turbine (71) and a turbine housing (72).

During operation of the gas turbine engine-recuperator combination (10), a turbocompressor (34) compresses air that may travel to a rear exchanger flow space (68) of the heat exchanger (56) via outer annular inlet passages (42 and 54). The outer annular inlet passages (42 and 54) are positioned between the annular outer casing (16) and the annular wall (38) of the gas turbine engine (12). The air may then continue to flow through an inner annular passage (66) and a forward exchanger flow space (70) of the heat exchanger (56) to the gas turbine (71) via an inner annular inlet air passage (86) that is positioned radially inward of the annular wall (38).

The Examiner alleges that the areas near apertured annular baffles (52) and the forward exchanger flow space (70) may be considered an inlet manifold and an outlet manifold, respectively. See page 3 of the April 4, 2006 Office Action. However, Dyste describes an outermost surface of the area near the apertured annular baffles (52) as corresponding to the outer annular casing (16). Further, Dyste describes an outermost surface of the area near the forward exchanger flow space (70) as corresponding to the annular wall (38). Notably, the outermost surface of the outer annular casing (16) and the outermost surface of the annular wall (38) are **not at a substantially equal** radial distance with respect to an axis of rotation of the turbine (71), but rather the outermost surface of the outer annular casing (16) is at a **greater** radial distance than the outermost surface of the annular wall (38).

Claim 8 recites a heat exchanger assembly for a gas turbine engine, the heat exchanger assembly including "an annular manifold comprising an inlet manifold coupled in flow communication with a compressor and an outlet manifold coupled in flow communication with a combustor, said annular manifold concentrically aligned with respect to an axis of rotation of the gas turbine engine, and said inlet manifold and said outlet manifold each including an outermost surface having a substantially equal radial distance with respect to the axis of rotation of the gas turbine engine . . . ."

Dyste does not describe nor suggest a heat exchanger assembly for a gas turbine engine as is recited in Claim 8. Specifically, Dyste does not describe or suggest a heat exchanger assembly including an inlet manifold and an outlet manifold each including an outermost surface having a substantially equal radial distance with respect to an axis of rotation of a gas turbine engine. Rather, in contrast with the present invention, Dyste describes the outer annular casing (16) having an outer surface located at a greater radial distance than an outer surface of the annular wall (38). Accordingly, for at least the reasons set forth above, Claim 8 is submitted to be patentable over Dyste.

Claims 9-10, 15 and 16, directly or indirectly, depend from Claim 8. When the recitations of Claims 9-10, 15 and 16 are considered in combination with the recitation of Claim 8, Applicants submit that dependent Claims 9-10, 15 and 16 likewise are patentable over Dyste.

Claim 17 recites a gas turbine engine having a heat exchanger assembly including ". . . an annular manifold comprising an inlet manifold coupled in flow communication with said

compressor and an outlet manifold coupled in flow communication with said combustor, said annular manifold concentrically aligned with respect to an axis of rotation of the gas turbine engine, and said inlet manifold and said outlet manifold each including an outermost surface having a substantially equal radial distance with respect to the axis of rotation of the gas turbine engine . . . ."

Dyste does not describe nor suggest a gas turbine engine having a heat exchanger assembly as is recited in Claim 17. Specifically, Dyste does not describe or suggest a heat exchanger assembly including an inlet manifold and an outlet manifold each including an outermost surface having a substantially equal radial distance with respect to an axis of rotation of a gas turbine engine. Rather, in contrast with the present invention, Dyste describes the outer annular casing (16) having an outer surface located at a greater radial distance than an outer surface of the annular wall (38). Accordingly, for at least the reasons set forth above, Claim 17 is submitted to be patentable over Dyste.

Claim 18 directly depends from Claim 17. When the recitation of Claim 18 is considered in combination with the recitation of Claim 17, Applicants submit that dependent Claim 18 likewise is patentable over Dyste.

For at least the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 8-10 and 15-18 be withdrawn.

The rejection of Claims 8-10 and 15-18 under 35 U.S.C. § 103(b) as being unpatentable over Zirin (U.S. Patent 3,201,938) ("Zirin") in view of Beam, Jr. et al. (U.S. Patent 3,386,243) ("Beam") or Dyste is respectfully traversed.

Zirin describes a gas turbine powerplant (10) including an axial flow compressor (11), a combustor (12), a gas turbine engine (13), a power turbine (14) and heat exchanger members (22). Each of the heat exchanger members (22) is connected to a plurality of conduits (27) including an outer annular header (23), an inner annular header (24) and conduits (25). During operation of the gas turbine powerplant (10), compressed fluid from a discharge portion (6) of the compressor (11) is directed through the conduits (25), the inner annular header (24), the heat exchanger members (22) and an interior of the outer header (23).

The Examiner alleges that the inner annular header (24) and the outer annular header (23) may be considered an inlet manifold and an outlet manifold, respectively. However, Zirin describes that the inner annular header (24) is **enveloped by** the outer header (23). Notably, the outermost surface of the outer annular header (23) and the outermost surface of the inner annular header (24) are **not at a substantially equal** radial distance with respect to an axis of rotation of the gas turbine engine (13), but rather the outermost surface of the outer annular header (23) is at a **greater** radial distance than the outermost surface of the inner annular header (24).

Beam describes a turboprop engine including a compressor (5), a diffuser (6), a combustion apparatus (7), a turbine (9) and an annular recuperator (10). During operation, air flows from the diffuser (6) to the recuperator (10) through air inlets pipes (13) that are spaced around an axis of the engine and heated air flows back to the combustion apparatus (7) through pipes (14) that are distributed around the engine axis. The air inlet pipes (13) and the pipes (14) are connected to a recuperator structure (18) that defines return flow paths for the compressed air entering through the air inlet pipes (13) and delivered through the pipes (14). Notably, Beam does not describe the details of the recuperator structure (18) **nor mentions annular inlet and outlet manifolds**, but rather describes the air inlet pipes (13) and the pipes (14) being attached to an outer shell (17) of the annular recuperator (10).

Dyste is described above.

No combination of Zirin, Beam and Dyste, describes or suggests a gas turbine engine having a heat exchanger assembly as is recited in Claim 8. Specifically, no combination of Zirin, Beam and Dyste describes or suggests a heat exchanger assembly including an inlet manifold and an outlet manifold each including an outermost surface having a substantially equal radial distance with respect to an axis of rotation of a gas turbine engine. Rather, in contrast with the present invention, Dyste describes the outer annular casing (16) having an outer surface located at a greater radial distance than the outer surface of the annular wall (38), Zirin describes the outermost surface of the outer annular header (23) located at a greater radial distance than the outermost surface of the inner annular header (24), and Beam merely describes the air inlet pipes (13) and the pipes (14) being attached to an outer shell (17) of the annular recuperator (10). Accordingly, for at least the reasons set forth above, Claim 8 is submitted to be patentable over Zirin in view of Beam or Dyste.

Claims 9-10, 15 and 16, directly or indirectly, depend from Claim 8. When the recitations of Claims 9-10, 15 and 16 are considered in combination with the recitation of Claim 8, Applicants submit that dependent Claims 9-10, 15 and 16 likewise are patentable over Zirin in view of Beam or Dyste.

No combination of Zirin, Beam and Dyste describes or suggests a gas turbine engine having a heat exchanger assembly as is recited in Claim 17. Specifically, no combination of Dyste, Zirin and Beam describes or suggests a heat exchanger assembly including an inlet manifold and an outlet manifold each including an outermost surface having a substantially equal radial distance with respect to an axis of rotation of a gas turbine engine. Rather, in contrast with the present invention, Dyste describes the outer annular casing (16) having an outer surface located at a greater radial distance than the outer surface of the annular wall (38), Zirin describes the outermost surface of the outer annular header (23) located at a greater radial distance than the outermost surface of the inner annular header (24), and Beam merely describes the air inlet pipes (13) and the pipes (14) being attached to an outer shell (17) of the annular recuperator (10). Accordingly, for at least the reasons set forth above, Claim 17 is submitted to be patentable over Zirin in view of Beam or Dyste.

Claim 18 directly depends from Claim 17. When the recitation of Claim 18 is considered in combination with the recitation of Claim 17, Applicants submit that dependent Claim 18 likewise is patentable over Zirin in view of Beam or Dyste.

The rejection of Claims 8-10, 15-18 and 21 under 35 U.S.C. § 103(b) as being unpatentable over any of the applied art, and further in view of Cook (U.S. Patent 2,925,714) ("Cook") or Moskowitz et al. (U.S. Patent 3,735,588) ("Moskowitz") is respectfully traversed.

Dyste, Zirin and Beam are described above.

Cook describes a diffuser-regenerator unit (10) including a cylindrical shell (12), vanes (14), a centrifugal compressor (16), a combustion chamber (28) and a turbine housing (38). During operation, the centrifugal compressor (16) compresses air that may then travel through passages (36), which constitute a vaned diffuser. After diffusion is completed at area (A), the diffused air travels through vanes (14) of a heat exchanger, the combustion chamber (28) and an outlet aperture (60). Notably, Cook does **not describe or suggest annular inlet**

and outlet manifolds each having a substantially equal radial distance with respect to an axis of rotation of a turbine engine, but rather describes the outlet aperture (60) being attached to the diffuser-regenerator unit (10) at a **greater** radial distance than an outermost surface of an air intake neck portion (15).

Moskowitz describes a turbine engine (11) including an air compressor (12), an annular forward heat exchanger (13) and a combustion chamber (14). Compressed air from the air compressor (12) is delivered through the annular heat exchanger (13) to the combustion chamber (14). The air may then be directed into a plenum (18) through an aft heat exchanger (19) and discharged through an exhaust section (21). Notably, Moskowitz does **not describe or suggest an annular inlet manifold** coupled in flow communication with a compressor **and an outlet manifold** coupled in flow communication with a combustor, each manifold having a substantially equal radial distance with respect to an axis of rotation of the turbine engine (11), but rather merely describes a **single** inner annular chamber for air flow through the compressor (12) and the combustion chamber (14).

No combination of Dyste, Zirin, Beam, Cook and Moskowitz describes or suggests a gas turbine engine having a heat exchanger assembly as is recited in Claim 8. Specifically, no combination of Dyste, Zirin, Beam, Cook and Moskowitz describes or suggests a heat exchanger assembly including an inlet manifold and an outlet manifold, each including an outermost surface having a substantially equal radial distance with respect to an axis of rotation of a gas turbine engine.

Rather, in contrast with the present invention, Dyste describes the outer annular casing (16) having an outer surface located at a greater radial distance than the outer surface of the annular wall (38), Zirin describes the outermost surface of the outer annular header (23) located at a greater radial distance than the outermost surface of the inner annular header (24), and Beam merely describes the air inlet pipes (13) and the pipes (14) being attached to an outer shell (17) of the annular recuperator (10). Further, in contrast with the present invention, Cook describes the outlet aperture (60) is attached to the diffuser-regenerator unit (10) at a greater radial distance than an outermost surface of the air intake neck portion (15), and Moskowitz merely describes a single inner annular chamber for air flow through the compressor (12) and the combustion chamber (14). Accordingly, for at least the reasons set

forth above, Claim 8 is submitted to be patentable over Dyste, Zirin and Beam, and further in view of Cook or Moskowitz.

Claims 9-10, 15, 16 and 21, directly or indirectly, depend from Claim 8. When the recitations of Claims 9-10, 15, 16 and 21 are considered in combination with the recitation of Claim 8, Applicants submit that dependent Claims 9-10, 15, 16 and 21 likewise are patentable over Dyste, Zirin and Beam, and further in view Cook or Moskowitz.

No combination of Dyste, Zirin, Beam, Cook and Moskowitz describes or suggests a gas turbine engine having a heat exchanger assembly as is recited in Claim 17. Specifically, no combination of Dyste, Zirin, Beam, Cook and Moskowitz describes or suggests a heat exchanger assembly including an inlet manifold and an outlet manifold each including an outermost surface having a substantially equal radial distance with respect to an axis of rotation of a gas turbine engine.

Rather, in contrast with the present invention, Dyste describes the outer annular casing (16) having an outer surface located at a greater radial distance than the outer surface of the annular wall (38), Zirin describes the outermost surface of the outer annular header (23) located at a greater radial distance than the outermost surface of the inner annular header (24), and Beam merely describes the air inlet pipes (13) and the pipes (14) being attached to an outer shell (17) of the annular recuperator (10). Further, in contrast with the present invention, Cook describes the outlet aperture (60) is attached to the diffuser-regenerator unit (10) at a greater radial distance than an outermost surface of the air intake neck portion (15), and Moskowitz merely describes a single inner annular chamber for air flow through the compressor (12) and the combustion chamber (14). Accordingly, for at least the reasons set forth above, Claim 17 is submitted to be patentable over Dyste, Zirin and Beam, and further in view of Cook or Moskowitz.

Claim 18, directly or indirectly, depend from Claim 17. When the recitation of Claim 18 is considered in combination with the recitation of Claim 17, Applicants submit that dependent Claim 18 likewise is patentable over Dyste, Zirin and Beam, and further in view Cook or Moskowitz.

Notwithstanding the above, the rejection of Claims 8-10, 15-18 and 21 under 35 U.S.C. §103(a) as being unpatentable over Zirin in view of Beam or Dyste and the rejection

of Claims 8-10, 15-18 and 21 under 35 U.S.C. § 103(b) as being unpatentable over any of the applied art, and further in view of Cook or Moskowitz are further traversed on the grounds that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify the structure of any of Zirin, Beam, Dyste, Cook or Moskowitz by applying the teachings of another applied art. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Rather, the present Section 103 rejection appears to be based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Since there is no teaching or suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants respectfully request that the Section 103 rejection be withdrawn.

Furthermore, in contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to combine Zirin, Beam, Dyste, Cook or Moskowitz. because there is no motivation to combine the references suggested in the art. Rather, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicants' own teaching.

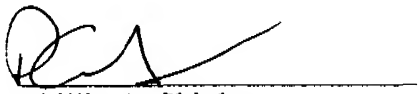
As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejections of Claims 8-10, 15-18 and 21 be withdrawn.

Claims 11-14 and 21 depend from independent Claim 8, and Claims 19-20 depend from independent Claim 17. Therefore, Claims 11-14 and 19-21 are also patentable over Dyste, Zirin, Beam, Cook and Moskowitz for at least the reasons discussed above with respect to Claims 8 and 17. Because 11-14 and 19-21 incorporate all features of the respective base Claims 8 and 17, respectively, rejoinder of claims 11-14 and 19-21 is respectfully requested upon allowance of independent Claims 8 and 17.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully submitted,



Phillip A. Shipley
Registration No. 51,357
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070